

## Contingent Resource Volume Update: Santos Basin Brazil

Karooon Gas Australia Ltd ('Karooon') is pleased to announce the initial Echidna light oil gross contingent 2C resource volume of 75mmbls (49 net to Karoon) in the company's 65% owned Santos Basin Brazil exploration blocks, S-M-1037, S-M-1101, S-M-1102, S-M-1165 and S-M-1166 ('the Blocks').

In addition, the integration of results from the recent drilling campaign along with new higher resolution re-processed 2 millisecond 3D seismic data into Karoon's geological models has resulted in the Kangaroo light oil gross contingent 2C resource being revised to 54mmbls (35mmbls net).

Notwithstanding the Kangaroo resource revision, the addition of Echidna equates to a very material 129mmbls total 2C resource (84mmbls net to Karoon). Greater well control and higher resolution seismic data has increased confidence around the contingent resource estimates, which is reflected in a tighter resource range between the 1C and 3C volumes.

Managing Director Mr Robert Hosking said; *"This increased confidence in the contingent resource, along with strong production test results and the shallow water and reservoir setting continue to support potential combined and standalone development options."*

In addition to the revised contingent resource volumes, Karoon has released a broader presentation on its Santos Basin Brazil, assets outlining development concepts under consideration for Echidna and / or Kangaroo. Note that the development concepts presented are reliant upon the further appraisal drilling and results that support a possible development.

The "Santos Basin Brazil: Resource Volumes and Development Concepts" presentation was released to the Australian Stock Exchange ('ASX') along-side this announcement and a webcast recording will be available on the Company's website, [www.karoongas.com.au](http://www.karoongas.com.au), in due course. A recording of the webcast recording will include a discussion of the Contingent Resource and outline the development concepts that could be utilised for Kangaroo and Echidna. Speakers will be;

- Mr Robert Hosking                      Managing Director, Karoon Gas Australia Ltd
- Mr Jose Formigli                        Project Development Advisor, Karoon Brazil
- Mr Ricardo Abi-Ramia                Project Manager, Karoon Brazil
- Mr Antonio Tisi                         Karoon Exploration Manager, Karoon Brazil

### Contingent Resource Estimates for Kangaroo and Echidna

Following the integration of the new well and seismic data an assessment of the contingent resource volumes can be made. The following tables provide a breakdown for each field.

<b><u>Echidna</u></b>					
	<b><u>Interest</u></b>	<b><u>Type</u></b>	<b><u>1C</u></b>	<b><u>2C</u></b>	<b><u>3C</u></b>
<b><u>Contingent Resource</u></b>	<b><u>100%</u></b>	<b><u>Oil (mmbls)</u></b>	<b><u>25</u></b>	<b><u>75*</u></b>	<b><u>152</u></b>
<b><u>NET TO KAROON</u></b>	<b><u>65%</u></b>	<b><u>Oil (mmbls)</u></b>	<b><u>16</u></b>	<b><u>49</u></b>	<b><u>99</u></b>

<b><u>Kangaroo</u></b>					
	<b><u>Interest</u></b>	<b><u>Type</u></b>	<b><u>1C</u></b>	<b><u>2C</u></b>	<b><u>3C</u></b>
<b><u>Contingent Resource</u></b>	<b><u>100%</u></b>	<b><u>Oil (mmbls)</u></b>	<b><u>20</u></b>	<b><u>54</u></b>	<b><u>100</u></b>
<b><u>NET TO KAROON</u></b>	<b><u>65%</u></b>	<b><u>Oil (mmbls)</u></b>	<b><u>13</u></b>	<b><u>35</u></b>	<b><u>65</u></b>

\* The contingent resource volumes represent Karoon's internal management estimates and have not necessarily been validated or agreed by joint venture partner Pacific Exploration and Production Corporation.

The Echidna and Kangaroo contingent resource estimates were assessed by Karoon's Engineering Manager, Mr Lino Barro on 16 September 2015 (see Competent Persons Statement below). They are based on an evaluation of;

- Mapping, using higher resolution re-processed 2 millisecond 3D seismic data;
- Well data including core samples, pressure information, wireline petrophysics, reservoir fluid properties and Production Testing data collected from Palaeocene and Maastrichtian Reservoir units in the Kangaroo-1, Kangaroo-2, Kangaroo-2 Up-Dip Sidetrack, Kangaroo-2 Down-Dip Sidetrack wells, and Echidna-1 exploration wells
- Reservoir models
- Data from other Karoon wells in the JV permits and wells in the surrounding area.

Estimates were prepared using a probabilistic method in accordance with the Petroleum Resources Management System (PRMS) approved in March 2007 by the Society of Petroleum Engineers, the World Petroleum Council, the American Association of Petroleum Geologists, and the Society of Petroleum Evaluation Engineers.

### **Kangaroo Field Contingent Resource Range Revisions**

Changes to the Kangaroo discovery's net contingent resource numbers of 1C 7mmbbls, 2C 88mmbbls, 3C 317mmbbls, announced 1 August 2013 resulted from new data obtained from the drilling of Kangaroo-2, including the up-dip and down-dip side-track wells and higher resolution 2millisecond 3D seismic data. Specific observations were;

- Kangaroo-2 and side-tracks intersected seven separate oil accumulations, all with different oil water contacts from those seen in Kangaroo-1.
- A gas cap was not intersected in any of the wells as previously predicted.
- Higher resolution 2 millisecond 3D seismic data has improved resolution and the accuracy of horizon and fault mapping.
- New exploration well calibrated seismic attribute mapping has helped to further understand the oil distribution in the field.
- Lower resolution seismic data used previously showed support for updip hydrocarbons but was not quantitatively conclusive.

The net impact of the new data and interpretation is reflected in the new narrower contingent resource range distribution. Consequently the level of certainty in the contingent resource range is now much greater.

### **Significant Prospectivity Remains**

Additional nearfield prospective resources has been identified in leads of the same Paleocene play type and in close proximity to Kangaroo and Echidna (Emu Up-dip, Joey and Puggle to date). These prospects and leads are located in ideal positions for later resource additions. Once better defined, these will provide targets for later drilling as low cost resource additions.

### **Next Steps**

#### **Geotechnical evaluation**

Karoon has completed the first stage of the geotechnical evaluation integrating all new well data, new 2 millisecond seismic and seismic inversion data. Reservoir simulation modelling is continuing and is still to be completed. Final results which are expected in the coming months, will form the basis of Subsurface Development Plans for both Echidna and Kangaroo and will include well locations/type, well and field production rates and field recovery factor estimates.

#### **Revised Appraisal Plan Approved by the Brazilian Oil and Gas Regulator**

Karoon has received approval from the Agência Nacional do Petróleo, Gás Natural e Biocombustíveis ('ANP'), advising that the revised Appraisal Plan ('PAD') has been approved

Key elements contained in the revised PAD are as follows:

#### **Firm Commitments**

- All firm commitments are to be completed by the 31<sup>st</sup> of December 2018

- Two wells expected to be drilled in the Emu / Echidna area
- Acquisition and processing of a 3D seismic survey over the full PAD acreage
- Pre-stack depth migration of data in 2 millisecond frequency
- Further processing of 2ms data to increase frequency / resolution

#### **Contingent Commitments**

- Contingent work program period will commence on the 1<sup>st</sup> of January 2019
- Consists of drilling up to four contingent wells
- Each contingent well drilled will result in a 6 month extension to the contingent period. Therefore if one well is drilled the contingent work period will extend until the 30<sup>th</sup> of June 2019. If all four wells are drilled then the contingent work program period will extend until 31 December 2020.

#### **Development Concept Review**

Provided the appraisal phase continues to be successful, Karoon will commence the development phase with an Early Production System (EPS), which may prove the resource for full field development.

Given the approval timelines involved in designing and implementing a production project either through an EPS or Full Field Development (FFD), Karoon has commenced its development concept review and now has a small team of very experienced Brazilian field development specialists. This team is led by Jose Formigli (ex-Director of E&P Petrobras) and Ricardo Abi-Ramia (EX-GM of Rio Business Unit Petrobras, a key project manager who designed, implemented and ran some of Petrobras key assets).

Work is continuing with a number of development concepts and combinations being considered. The field development concept presented today provides confidence that a project is economically probable based on current resource estimates and oil price assumptions. Development concepts will be outlined in more detail in the webcast and presentation.

For risk and capital management optimization, a staged development is considered the most likely outcome. This approach takes advantage of the current lower cost environment for development components. The key drivers are;

- To bring Echidna then Kangaroo production on stream as soon as possible via an EPS, ensuring Karoon Health, Safety & Environment (HS&E) standards.
- Flexibility to adapt to reservoir behaviour and maximise hydrocarbon recovery.
- Minimise technical risks.
- Schedule to first oil, and flexibility for expansion.
- Operability, reliability and availability.
- Capitalise on market conditions and reduce capital expenditure up front.
- Maximising returns on capital invested.

#### **Karoon's Interest**

Karoon holds a 65% interest in, and is operator of the jointly held *S-M-1037, S-M-1101, S-M-1102, S-M-1165 and S-M-1166 Blocks*, Santos Basin. Pacific Exploration and Production Corp holds the remaining 35%

Managing Director, Mr. Robert Hosking said:

*The forward plan is to progress to FID at minimum cost and to be in a position to progress with the implementation of the project in a staged and risked managed approach where major capital is not committed until all variables are understood and a good return to shareholders will result.*

*Ongoing refined geological and geophysical studies have identified a number of Paleocene leads with similar amplitude anomalies to that seen in the discovered fields. These may provide additional exciting upside exploration potential in this permit."*

#### **SPE-PRMS Standards**

Society of Petroleum Engineers- Petroleum Resource Management System-Petroleum resources are the estimated quantities of hydrocarbons naturally occurring on or within the Earth's crust. Resource assessments estimate total quantities in known and yet-to-be discovered accumulations, resources evaluations are focused on those quantities that can potentially be recovered and marketed by commercial projects. A petroleum

resources management system provides a consistent approach to estimating petroleum quantities, evaluating development projects, and presenting results within a comprehensive classification framework.

### **Contingent Resource**

Basis for assessment of the Kangaroo and Echidna Contingent Resources Range- Those quantities of petroleum estimated, as of a given date, to be potentially recoverable from known accumulations by application of development projects, but which are not currently considered to be commercially recoverable due to one or more contingencies.

- 1C- Denotes the low case estimate scenario of Contingent Resources- when applied to the Kangaroo and Echidna fields. The 1C resource only includes reservoir sands that had directly penetrated oil columns by wellbores drilled within the fields. Reservoir sands below the deepest penetrated oil are excluded. Areas away from drilled wellbores are restricted laterally and vertically to occur within a 90% confidence limit. Mapping including seismic attributes is taken into account. Other oil-in-place input parameters such as net-to-gross, porosity and oil saturation are assumed at a 90% confidence limit. Recovery factor estimates are based on extensive reservoir simulation modelling results and the 1C recovery factor assumes reduced sand continuity, natural depletion without pressure support from a connected aquifer and gas reinjection.
- 2C- Denotes the best estimate scenario of contingent resources. When applied to the Kangaroo and Echidna fields the 2C resource includes the 1C resource. The 2C resource includes reservoir sands below the deepest penetrated oil depth, extending to a depth mid-way down to the pressure interpreted free water level (FWL) depth. Areas away from drilled wellbores are restricted laterally and vertically to occur within a 50% confidence limit. Mapping including seismic attributes is taken into account. Other oil-in-place input parameters such as net-to-gross, porosity and oil saturation are at a 50% confidence limit. Recovery factor estimates are based on extensive reservoir simulation modelling results and the 2C recovery factor assumes improved natural depletion with higher compaction drive but without pressure support from a connected aquifer and gas reinjection.
- 3C- Denotes the high estimate scenario of contingent resources. When applied to the Kangaroo and Echidna wells, the 3C resource includes the 1C resource and 2C resource. The 2C resource includes reservoir sands below the deepest penetrated oil depth, extending to the pressure interpreted free water level (FWL) depth. Areas away from drilled wellbores are restricted laterally and vertically to occur within a 10% confidence limit. Mapping including seismic attributes is taken into account. Other oil-in-place input parameters such as net-to-gross, porosity and oil saturation are assumed at a 10% confidence limit. Recovery factor estimates are based on extensive reservoir simulation modelling results and the 3C recovery factor assumes natural depletion with pressure support from a connected aquifer, and or purpose drilled water injection wells and gas reinjection.

### **Competent Persons Statement**

Any petroleum reserves, contingent resources and prospective resources information contained in this announcement is based on, and fairly represents, information and supporting documents prepared by, or under the supervision of, Mr Lino Barro, Karoon Gas Australia Ltd, Engineering Manager. Mr Barro has the following qualifications B.Eng. (Chemical), MBA. Mr Barro is a member of the Society of Petroleum Engineers. Mr Barro has consented in writing to the inclusion of this information in the format and context in which it appears.

### **About Karoon Gas Australia Ltd**

Karoon Gas Australia Ltd is an international oil and gas exploration company with projects in Australia, Brazil and Peru and a member of the S&P/ASX 200 Index.

Karoon looks for high equity interests in early stage exploration opportunities containing large potential targets in basins with proven Petroleum Systems. Karoon strives to create shareholder value through the geotechnical work-up of the acreage, leveraging its high equity interests to explore and appraise these opportunities to achieve commercialisation.

While the Company's core strategy is identifying off-shore early stage exploration opportunities, Karoon's longer-term strategy is to retain residual equity interests in the assets as they go into production.

**For further information please see the Karoon website or contact:**

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